REMARKS

This is a full and timely response to the outstanding non-final Office Action mailed August 9, 2005. Reconsideration and allowance of the application and presently pending claims, as amended, are respectfully requested.

Present Status of the Application

The title is objected to as being not descriptive. The Office Action rejected claims 1-4, 10-12 and 14. Specifically, the Office Action rejected claims 1-2, 11-12 and 14 under 35 U.S.C. 102 (b), as being anticipated by US Patent No. 6,240,504 B1 (hereinafter "Boutaud"). The Office Action also rejected claims 3-4 and 10 under 35 U.S.C. 103 (a) as being unpatentable over Boutaud in view of U.S. Patent 5,668,971 (hereinafter "Neufeld"). Furthermore, Claims 5-9 and 13 are objected to as being dependent upon rejected based claims, but would be allowable if rewritten in correct form.

Upon entry of the amendments in this response, claims 3, 5-9, 13 remain pending in the present application. More specifically, claims 3, 5, 9, and 13 are directly amended; claims 1, 2, 4, 10-12 and 14 are canceled without prejudice, waiver, or disclaimer. These amendments and additions are specifically described hereinafter. It is believed that the foregoing amendments and additions add no new matter to the present application.

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Response to Objections to Title

In response to the Office Action, Applicants have changed the title and related specification as presented above. It is requested that the objection be withdrawn.

Response To Claim Rejections under 35 USC 102(b)

The outstanding Office Action rejected claims 1-2, 11-12 and 14 under 35 U.S.C 102(b), as being anticipated by Boutaud. Applicants have canceled claims 1-2, 11-12 and 14 as presented above, rendering the above rejections moot.

Response To Claim Rejections under 35 USC 103(a)

The Office Action rejected claims 3-4 and 10 under 35 U.S.C. 103 (a) as being unpatentable over Boutaud in view of Neufeld. Applicants have amended claim 3 and canceled claims 4 and 10 as presented above.

It is well established at law that, for a proper rejection of a claim under 35 U.S.C. §103 as being obvious based upon a combination of references, the cited combination of references must disclose, teach, or suggest, either implicitly or explicitly, all elements/features/steps of the claim at issue. See, e.g., In Re Dow Chemical, 5 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1988), and In re Keller, 208 U.S.P.Q.2d 871, 881 (C.C.P.A. 1981).

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Independent Claim 3, as amended, states:

A microcontroller device for extending memory address space by inserting a waiting state, wherein the device is coupled to an external memory through a bus, and the external memory has stored at least a first program, the device comprising:

a read-only memory (ROM), for storing a second program;

a central processing unit (CPU), coupled to the ROM, for executing the first program or the second program; and

a memory interface controller, for inserting a waiting state into the CPU when the CPU intends to execute an instruction of the first program stored in the external memory; **_wherein the memory interface controller comprises:_**

a memory interface, coupled the bus, serving as a transmission interface between the memory interface controller and the bus;

*a **_range checking unit_**, used to judge whether or not an address of an information, which is **_to be accessed by the CPU_**, is located within a predetermined range, and **_selectively_** issuing a **_range checking signal_**; and*

***_a state control unit_**, coupled to the memory interface, the range checking unit, and the CPU, used for **_inserting the waiting state into the CPU_** when the range checking signal is received.*

Amended Independent claim 3 is allowable for at least the reason that the combination of Boutaud in view of Neufeld does not disclose, teach, or suggest the features that are highlighted in claim 3 above. More specifically, Boutaud fails to teach **_a waiting state_** (clock rate of CPU maintained) **_being inserted into the CPU_** as illustrated in the present application (see Fig. 4 of present application, the clock rate of the CPU is maintained till fetch completes; or paragraph [0040] for detailed explanation). Boutaud does not suggest or teach the claimed **features inherent in the hardware architecture of the present application,** because Boutaud does not use

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the CPU halting but toward a software approach intrinsic in software programmable

numbers being **added** to CPU **(no clock rate maintained)**. As disclosed in Boutaud,

"the problem is solved in the preferred embodiment of Fig. 26 and 27 by providing

software controlled wait state defined on memory page address ranges..".

Furthermore, Boutaud defines its element 977 as an **on-chip decoder** which "decodes

the most significant bits MSB representing the page of memory which is being

addressed" (lines 58-59, col. 40); Boutaud further defines its element 971 as a **wait**

state generator which "correspondingly **counts down to zero and thereby produces**

the wait states defined by the nibble" (lines 63-65, col. 40). The element 977 and 971

of Boutaud does not teach or disclose the claimed features as illustrated above of

state control unit and **range checking unit** of the present invention.

Boutaud, as also pointed out by the Examiner, fails to expressly teach

"**selectively** issuing a **range checking signal**", which is one of the features inherent

in the hardware architecture of the present application. The purpose of

selectively issuing a range checking signal is to issue control signal (depending

on instructions fetched by the CPU) to state controller 128 for inserting wait

state into CPU 112 to cause the clock state to maintain. Boutaud uses **software**

wait states approach which does not teach or disclose any motivation to "selectively"

issuing a range checking signal to be inserted into CPU to maintain clock rate.

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Nuefeld, however, provides a _hardware_ approach with "the special **circuity** which compares the desired memory address with the low and high memory range protection addresses stored in the special registers and determines if the memory **READ request address** is within the range of protected addresses" (lines 19-24, col. 4). <u>The combination of Boutaud in view of Neufeld is improper in that the references teach away from each other and the claimed invention.</u> Furthermore, Neufeld does not teach or disclose the claimed feature of "selectively issuing a range checking signal" as defined in the claim. Neufeld utilizes a posted READ technique in the field of muti-tasking paging memory management, which is different from the claimed feature.

Consequently, the combination of Boutaud in view of Neufeld does not render claim 3 obvious, and the rejection should be withdrawn.

Response To Objections To Claims

The Examiner objected to claims 5-9 and 13 because of being dependent upon rejected based claims. Applicants have amended claims as required. In view of the aforementioned amendments, Applicants respectfully assert that the objections are no longer proper.
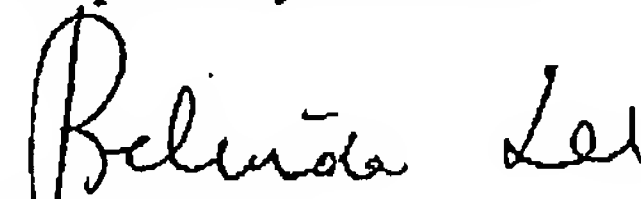
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CONCLUSION

In light of the foregoing amendments and for at least the reasons set forth above, Applicant respectfully submits that all objections and/or rejections have been traversed, rendered moot, and/or accommodated It is believed that all the pending claims are in condition for allowance. Favorable reconsideration and allowance of the present application and all pending claims are hereby courteously requested. If, in the opinion of the Examiner, a telephonic conference would expedite the examination of this matter, the Examiner is invited to call the undersigned attorney.

Respectfully submitted,

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